APREN's analysis to 2024

Record 80.4% in renewable electricity production

- In 2024, electricity production increased by 3.3% compared to last year;
- Electricity production from renewable sources also grew, by 10.8%, reaching a record of 80.4% year-to-date;
- Installed renewable capacity increased by 8% compared to the total installed at the end of 2023 – of these, around 86% relate to solar photovoltaic renewable capacity;
- At European level, the year is marked by the significant reform of the European electricity market, highlighting the promotion of long-term contracts (Power Purchase Agreements (PPAs) and Contracts for Difference (CfDs), support for non-fossil flexibility, products to reduce consumption peaks, promotion of forward markets and public intervention in abnormally rising price crises;
- At the national level, the revision of the National Energy and Climate Plan (PNEC 2030) was approved, with more ambitious targets: 43.2 GW of installed renewable capacity by 2030, more than double of what currently exists.

The performance of renewable electricity in 2024:

In short, all power plants operating in mainland Portugal produced, in 2024, a total of 45,637 GWh of electricity, 80.4% of which came from renewable sources. Renewable production thus grows by 10.8 percentage points (p.p.) compared to 2023, confirming a new record for national renewable electricity generation. With regard to the supply of consumption, the renewable component contributed with 71.5%, confirming the progress towards the 93% target of the 2030 PNEC.

This total was mostly supported by three technologies: hydro, which contribution totaled 31.9%, and this percentage corresponds to a new absolute maximum in the last five years (14,542 GWh); wind, which added 31.0% to total renewable production; and solar photovoltaic, which contribution totalled 10.7% of the total produced, also a record (4,898 GWh).

Electricity production from fossil fuels decreased by 49% compared to total electricity in 2023, due to the significant increase in hydro production, of 5.2 p.p., but also of wind and solar (with increases of 1.7% and 2.5%, respectively). These figures result from the entry into operation of new plants – corresponding to an increase of 8% (1509 MW), of which 86% are solar photovoltaic – as well as the significant negative variation in electricity production from fossil fuels, with a special emphasis on the reduction of 10.7 p.p. in production through natural gas.

Regarding international trade, compared to 2023, there was stagnation in the import balance, with a variation of 2%, from 10,218 GWh in 2023 to 10,442 GWh. Renewable electrical producibility was quite high, with 1,867 non-consecutive hours, in which consumption was fully supplied by renewable power plants. This fact resulted from a strong hydroelectric, wind and solar capability.

Regarding greenhouse gas (GHG) emissions from the power generation system, APREN estimates a reduction of around 50% compared to 2023. In absolute terms, this reduction translates into a decrease from 3.6 million tonnes of CO_2 in 2023 to 1.82 million tonnes in 2024. Contributing to this significant reduction in emissions from the national electricity generation system, is the 18.8 p.p. increase in renewable incorporation (from 69.6% in 2023 to 80.4% in 2024) and, consequently, the 11.5 p.p. reduction in the incorporation of electricity produced from fossil fuels (from 22.7% in 2023 to 11.2% in 2024).

These important renewable sector milestones in 2024 have resulted in numerous benefits for society, the economy and the environment, of which the following stand out:

- **11.7 Mt CO_2eq emissions avoided**;
- **A saving of 2,055 M€**[1] **on fossil fuel imports;**
- **A saving of 289 M€**[2] **in electricity imports**;
- **Savings in CO_2 emission allowances of 715 M€**[3], reflecting the average annual price of allowances of €65.1/tCO_2.
- **Savings in the energy component of the electricity tariff** inherent to the effect of the merit order amounting to around €8.84 billion.

Legislative news in the sector in 2024:

In legislative terms, the European Union (EU) has strengthened several measures to make energy affordable for households and businesses and to ensure access to clean, secure and diversified energy sources.

These also aimed to strengthen the EU's competitiveness in the energy sector, allowing Europe to increase its commitment to the decarbonisation of its economy and reduce external energy dependencies, thus confirming its ambition to be a pioneer in carbon neutrality by 2050 and simultaneously increase the level of its energy independence.

We list below the most relevant ones at European level:

- Regulation (EU) 2024/1252 (April): aims to ensure a secure and sustainable supply of critical raw materials, indispensable to the EU economy and a set of technologies needed for strategic sectors, such as renewable energy. The aim is to ensure that Europe charts a path that, through extraction, processing and recycling, fulfilling the goal of a circular and non-verticalised economy, ensures access to the critical raw materials needed to meet its climate objectives for 2030 and 2050;
- In May, with the celebration of the second year of the REPowerEU Plan, the European Commission announced that, with the support of the actions of citizens, businesses and Member States, it had managed to exceed its target of reducing natural gas demand by 15%, which decreased by 18% between August 2022 and March 2024, resulting in savings of around 125 billion cubic meters (bcm) of natural gas[4]. Along with the plan's balance, it also presents a new set of pieces of legislation with the aim of accelerating the objectives inherent to security of supply and the energy transition. These pieces include two recommendations:
    - Recommendation (EU) 2024/1343 (May): sets out a number of recommendations on the simplification of permit-allocation procedures for renewable projects and power purchase agreement processes;
    - Recommendation (EU) 2024/1344 (May): provides guidance on the design of auctions for the allocation of support to renewable energy projects in the Member States.
- Regulation (EU) 2024/1735 (June): creates measures to strengthen the European manufacturing ecosystem of carbon-neutral technology products in order to promote the improvement of the internal market and the associated supply chains;

[1] Value calculated through the import prices of coal (values up to November 2020, DGEG) and natural gas (WorldBank) and the annual production of electricity using these fossil fuels (Data Hub REN).

[2] Value calculated using Spain's electricity prices (ENTSO-e) and amount of electricity imported (REN).

[3] Value calculated based on CO_2 emissions avoided and the price of carbon allowances (SENDECO2).

[4] Source: CE, REPowerEU, 2024

- Directives (EU) 2024/1711 and Regulation 2024/1747 (June): introduced changes to the European Union's electricity market design, focusing on ensuring affordable and competitive prices for individual consumers and businesses, encouraging the transition to renewable energy sources and modernising electricity grids; At the same time, they introduce guidelines in the field of consumer protection (the right to contracts with fixed or dynamic prices, facilitated access to contractual offers and protections against unilateral changes by suppliers; as well as the introduction of rules for energy sharing and the establishment of energy communities.

As for Portugal, the following pieces of legislation and energy policy frameworks stand out:

- Decree-Law No. 22/2024 (March), which extended, until 31 December 2024, the validity of the exceptional measures for the simplification of the procedures for energy projects from renewable plants;
- The Minister of Environment and Energy announced the auction for the centralised purchase of renewable gases, with an annual budget of 14 million euros per year over a 10-year time horizon (140 million euros of total investment). Ita aims at encouraging projects in the field of green hydrogen and biomethane, with the goal of contracting 150 GWh/year and 120 GWh/year of biomethane and green hydrogen (Ordinance No. 15/2023, of January 4);
- Update of the National Energy and Climate Plan 2030 (PNEC 20230) on October 1st, which ratified many of the previously presented targets and reinforced it with a set of very ambitious new targets:
  - The GHG emissions reduction target has been raised to **55% by 2030** (compared to 2005 levels), which represents the upper end of the previously planned range (45%-55%). The target for the share of renewables in gross final energy consumption has been adjusted to **51% by 2030**, up from 47% previously forecast. This increase signals confidence in the potential for attracting investment from the private sector associated with renewable energy;
  - Installed renewable capacity by 2030: from 27.4 GW initially planned to 43.2 GW**:**
    - **Solar:** revision from 9.0 GW to **20,8 GW**;
    - ***Onshore wind*****:** revision from 9.0 GW to **10,4 GW**, with a focus on repowering existing plants**;**
    - ***Offshore wind*****:** revision form 0,03 GW to **2 GW**, evidencing a strategic commitment to this emerging technology;
  - Setting a new target for **2 GW battery storage** by 2030.
- Creation of **EMER** – Mission Structure for the Permitting of Renewable Energy Projects 2030, which aims to ensure a more transparent, agile and simplified procedural regime, in order to stimulate the development of the renewable sector;
- Decree-Law No. 99/2024, which partially transposes the Renewable Energy Directive (RED III), introducing innovations in the simplifying of licensing of renewable projects, promoting self-consumption and energy communities, reviewing guarantees and compensation to municipalities, adjustments to the electro-intensive customer regime and improvements in the transparency of bilateral energy contracting, adapting the legislative framework to support the energy transition and green re-industrialization;
- Order No. 15185-C/2024, which approves the Regulation for the Attribution of Compensation to Municipalities;
- Decree-Law No. 116/2024, which extends the exceptional measures to simplify the procedures for the production of energy from renewable sources provided for in Decree-Law No. 30-A/2022 and Decree-Law No. 72/2022, until 31 December 2026;

What are the biggest challenges and opportunities?

In the year under review, the European renewable energy sector has made significant progress. However, it also faced serious constraints to its development, one of which was a significant volatility in electricity prices, with the Iberian market being no exception.

The transition to renewable energy sources, which still lacks an adaptation of the market design provided for in the revision of the directive, has demonstrated the weaknesses of the daily and intraday energy market design, with increasing exposure to zero and negative prices and, while at other times there are sharp price peaks, especially at times when the market closes with natural gas-fired combined cycle plants. Without a quick regulatory response and with the prospect of growth in the sector in general, this situation is expected to worsen in 2025.

On the other hand, the rate of electrification of energy consumption in the European economy has remained stagnant at around 23% in recent years[5]. Failure to increase the electrification of energy consumption represents a serious obstacle to the decarbonisation of industrial sectors. Actors such as the volatility of the energy component in electricity prices and the still high dependence on global supply chains affect the European industrial sector, to which is added competition with economies from the rest of the world, especially China and the United States of America.

The Iberian market, on the other hand, has been the scene of demand from the green industry, attracted by low electricity prices, high fiber connectivity and available land, there is a high demand for green industry with operational capacity, with a potential for significant increase in demand, reflected in the national PNEC 2030. Industrial consumption grew 3% between January and October 2024, partially reversing the decline seen since 2008. As renewables lower Iberian electricity prices, industrial demand is projected to increase by 1.9% year-on-year by 2060 due to an increase in production from current industries, new developing industries in the Iberian Peninsula and electrification of industrial processes[6].

The transposition of RED III and the Electricity Market Reform, already legislated through a European Regulation, provides for a favourable legislative framework adapted to the needs in order to achieve the decarbonisation objectives. Together with the expected growth in electricity demand in the Iberian Peninsula, it will help mitigate price cannibalization and the integration of renewable energy in the short and medium term.

It is expected that the revision of the Electricity Transmission and Distribution Network Development and Investment Plans should anticipate investments to meet the renewable electricity targets set out in the 2030 NECP, presenting solutions to modernise and expand electricity grids, as well as to develop flexibility solutions.

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About APREN:
The Portuguese Renewable Energy Association (APREN) is a non-profit association founded in October 1988. Its mission is to coordinate and represent the common interests of its members, promoting renewables energies in the electricity field. APREN works together with official bodies and other similar entities, at national and international level, constituting an instrument of participation in energy and environmental policies through the use and valorization of natural resources for electricity production, namely in the fields of hydro, wind, solar, geothermal, biomass, biogas and urban solid waste.

[5] Source: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Electricity_and_heat_statistics
[6] Source: https://auroraer.com/insight/iberian-energy-demand-data-centers/